

EXHIBIT 101

HIGHLY CONFIDENTIAL // SUBJECT TO PROTECTIVE ORDER

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA**

UNITED STATES OF AMERICA, ET AL.,

Plaintiffs,

v.

GOOGLE LLC,

Defendant.

Civil Action No.: 1:23-cv-00108 (LMB/JFA)

Expert Report of Anthony J. Ferrante

January 23, 2024

HIGHLY CONFIDENTIAL // SUBJECT TO PROTECTIVE ORDER

Table of Contents

Table of Contents.....	2
Introduction.....	3
Qualifications.....	4
Compensation.....	5
Summary of Opinions.....	6
Introduction: Advertising Fraud and Malvertising.....	7
The Threat Actors.....	8
The Impact of Ad Fraud and Malvertising on Advertisers, Publishers and Consumers.....	9
Forms of Advertising Fraud and Malvertising.....	11
Detailed Opinions.....	17
Google's Steps to Address Malvertising and Advertising Fraud in the Digital Advertising Ecosystem.....	17
Google Has Played a Leading Role in Developing Industry Standards to Address Malvertising and Ad Fraud.....	21
Google Detected and Played a Leading Role in the Takedown of 3ve, Collaborating with White Ops, the FBI, and Industry Participants.....	22
Header Bidding.....	28
The Rise of Header Bidding Created Additional Opportunities for Fraudulent Activity, Largely in the Form of Domain Spoofing.....	28
Inability to Prevent Ad Fraud Among the “Noise”.....	28
Lack of Guardrails Against Malvertisers.....	29
Data Leakage.....	30
Google's Open Bidding Technology.....	31
Conclusion.....	32
Appendix A: Curriculum Vitae of Anthony J. Ferrante.....	33
Expert Retention.....	34
Awards.....	34
Notable Professional Activities.....	34
Featured Media Appearances.....	35
Recent Publications.....	36
Notable Speaking Engagements.....	38
Appendix B: Materials Referenced and Relied On.....	41
Appendix C: “Bad Ads” Takedown Subcategories.....	47

HIGHLY CONFIDENTIAL // SUBJECT TO PROTECTIVE ORDER

Introduction

1. I, Anthony J. Ferrante, am a Senior Managing Director and Global Head of Cybersecurity at FTI Consulting, Inc. (“FTI”). I have been retained by counsel (“Counsel”) for Google LLC .
2. In this report, I opine on certain issues based on cybersecurity, privacy and security relating to digital advertising.
3. Except as otherwise noted, I have personal knowledge as to all the information set forth in this report. All facts and opinions included in this report are based upon my personal experiences and knowledge relating to cybersecurity, information supplied to me by Counsel, and my review of other relevant information related to the Plaintiffs’ claims.

HIGHLY CONFIDENTIAL // SUBJECT TO PROTECTIVE ORDER

Qualifications

4. I have more than 25 years of top-level cybersecurity and cyber-related experience, providing incident response and preparedness planning to over 1,000 private sector and government organizations, including more than 175 Fortune 500 companies and 70 Fortune 100 companies. I maintain first-hand operational knowledge of more than 60 criminal and national security cyber threat sets, or various groups of threat actors, and have extensive practical experience researching, designing, developing, and hacking complex technical applications and hardware systems.
5. Prior to joining FTI, from October 2015 to April 2017, I served as Director for Cyber Incident Response on the White House's National Security Council, where I coordinated U.S. responses to unfolding domestic and international cybersecurity crises and issues. Building on my extensive cybersecurity and incident response experience, I led the development and implementation of Presidential Policy Directive 41: United States Cyber Incident Coordination, the federal government's national policy guiding cyber incident response efforts.
6. Before joining the National Security Council, I was Chief of Staff of the Federal Bureau of Investigation ("FBI") Cyber Division from March 2014 to October 2015. I joined the FBI as a special agent in 2005, assigned to the FBI's New York Field Office. In 2006, I was selected as a member of the FBI's Cyber Action Team, a fly-team of experts who deploy globally to respond to the most critical cyber incidents on behalf of the U.S. government. During my time at the FBI, I oversaw cases relating to malvertising and advertising fraud. A copy of my Curriculum Vitae, which further describes my background, is provided as Appendix A.

HIGHLY CONFIDENTIAL // SUBJECT TO PROTECTIVE ORDER

Appendix A: Curriculum Vitae of Anthony J. Ferrante

Anthony J. Ferrante is a Senior Managing Director and Global Head of Cybersecurity at FTI Consulting. Mr. Ferrante is an expert in data privacy and cybersecurity resilience, prevention, response, remediation, and recovery services.

Mr. Ferrante has more than 25 years of top-level cybersecurity experience, providing incident response and readiness planning to more than 1,000 private sector and government organizations, including more than 350 Fortune 500 companies and 90 Fortune 100 companies. He advises companies within the most regulated industries in the world, including large companies in finance and technology on their toughest cybersecurity challenges, from regulation and legislation enforcement (including DFARS, HIPAA, ITAR, GDPR, CCPA, NYDFS, and PCI DSS) to expert witness litigation. Mr. Ferrante maintains first-hand operational knowledge of more than 60 criminal and national security cyber threat sets, or various groups of threat actors, and extensive practical expertise researching, designing, developing, and hacking technical applications and hardware systems, allowing for unparalleled client advisory and support in complex investigations and litigation.

Prior to joining FTI Consulting, Mr. Ferrante served as Director for Cyber Incident Response at the U.S. National Security Council at the White House where he coordinated U.S. response to unfolding domestic and international cybersecurity crises and issues. Building on his extensive cybersecurity and incident response experience, he led the development and implementation of Presidential Policy Directive 41 – United States Cyber Incident Coordination, the federal government’s national policy guiding cyber incident response efforts.

Before joining the National Security Council, Mr. Ferrante was Chief of Staff of the FBI’s Cyber Division. He joined the FBI as a special agent in 2005, assigned to the FBI’s New York Field Office. In 2006, Mr. Ferrante was selected as a member of the FBI’s Cyber Action Team, a fly-team of experts who deploy globally to respond to the most critical cyber incidents on behalf of the U.S. Government.

Mr. Ferrante was an Adjunct Professor of Computer Science at Fordham University’s Graduate School of Arts and Sciences, where he served as the founder and co-director of the Master’s of Science in Cybersecurity Program in the Graduate School of Arts and Sciences. During his time at Fordham University, he served as the co-director of the undergraduate and graduate cybersecurity research program.

Mr. Ferrante received the 2019 Global Leaders in Consulting award for his Excellence in Execution from *Consulting* magazine and has been recognized as a Data Expert by *Who’s Who Legal* (2021, 2022, 2023), and in the global-wide Cybersecurity Risk, Crisis & Risk Management *Chambers & Partners* 2021 and 2022 guides. *The Consulting Report* named him one of the Top 25 Technology Consultants and Leaders of 2023.

In August 2019, Mr. Ferrante summited Mount Kilimanjaro, the highest mountain in Africa and the highest single free-standing mountain in the world. In November 2022 and 2023, he ran and completed the TCS New York City Marathon.

HIGHLY CONFIDENTIAL // SUBJECT TO PROTECTIVE ORDER

Expert Retention

- *Pennsylvania Department of State v. Dush*, No. 322 M.D. 2021 (Pa. Cmwlth. filed Jan. 10, 2020). Declaration issued October 2021.
- *Proofpoint, Inc. v. Vade Secure, Inc.*, No. 19-CV-04238-MMC, 2023 WL 3395121 (N.D. Cal. Apr. 18, 2023). Expert report issued March 2021; deposition taken April 2021; testimony provided August 2021.
- *Certain Lithium Ion Batteries, Battery Cells, Battery Modules, Battery Packs, Components Thereof, and Processes Therefor*, USITC Inv. No. 337-TA-1159 (Feb. 10, 2021). Expert witness for LG Chem Ltd. regarding cybersecurity measures.
- *CDK Global, LLC v. Brnovich*, 2020 WL 5370758 (D. Ariz. Sept. 8, 2020). Expert report issued October 2019. Deposition taken February 2020. Testimony provided June 2020.
- *Gubarev v. BuzzFeed, Inc.*, 340 F. Supp. 3d 1304, 1308 (S.D. Fla. 2018). Expert report issued May 2018. Deposition taken July 2018.
- *In re Yahoo! Inc. Customer Data Sec. Breach Litig.*, No. 16-MD-02752-LHK, 2019 WL 387322 (N.D. Cal. Jan. 30, 2019). Expert report issued September 2018.

Awards

- Ranked Individual, Band 1, Cybersecurity Risk, Crisis & Risk Management Global-wide, *Chambers & Partners* (2023).
- Data Experts, Data 2023, *Who's Who Legal* (2023).
- Top 25 Technology Consultants and Leaders of 2023, *The Consulting Report* (2023).
- Ranked Individual, Band 1, Cybersecurity Risk, Crisis & Risk Management Global-wide, *Chambers & Partners* (2022).
- Thought Leader, Data, USA, Data Experts 2022, *Who's Who Legal* (2022).
- Thought Leader, Data, USA, Information Technology 2022, *Who's Who Legal* (2022).
- Ranked Individual, Spotlight Table, Cybersecurity Risk, Crisis & Risk Management Global-wide, *Chambers & Partners* (2021).
- Data Experts, Data 2021, *Who's Who Legal* (2020).
- Global Leaders in Consulting, Excellence in Execution, *Consulting Magazine* (2019).
- Tech 25 Innovators & Disruptors, *Washington Life* (2019).

Notable Professional Activities

- Member, Ethics & Integrity Committee, Cellebrite, September 2021.
- Founder, Federal Bureau of Investigation Chief Information Security Officer (CISO) Academy, September 2015.

HIGHLY CONFIDENTIAL // SUBJECT TO PROTECTIVE ORDER

- Co-Founder, Master's Degree in Cyber Security at Fordham University, September 2012.
- Founder, International Conference on Cyber Security, Fordham University, January 2007.

Featured Media Appearances

- [The Wall Street Journal, How to Get a True View of Cyber Risk, June 2023](#)
- [CNN, Putin's Army of Hackers are Targeting America, October 2021](#)
- CNN, *Websites and Apps Go Dark Around the World*, June 2021
- CNN, *FBI Director Wray Compares Ransomware Threat to 9/11*, June 2021
- [GovInfoSecurity, Microsoft's Smith SolarWinds Attack Involved 1,000 Developers, February 2021](#)
- [CNN, Analyst explains why hospitals are vulnerable to hackers, October 2020](#)
- CNN, *Feds: Russia & Iran Have Interfered with Presidential Election*, October 2020
- [Fordham, 2020 President Report: Cybersecurity and a Networked World, March 2020](#)
- [USA Today, Will Your Vote Count? Veil of Secrecy Makes It Impossible for Florida Voters to Know, February 2020](#)
- [CNN, Here's How Iran Could Bring This Fight into American Homes, January 2020](#)
- CNN, *DHS May Update Terror Threat Advisory After U.S. Killing of Top Iranian General*, January 2020
- CNN, *Police: Six Officers Shot in Philadelphia*, August 2019
- [CNN, FBI: Dayton Shooter Was Exploring Violent Ideologies, August 2019](#)
- CNN, *Death Toll Rises to 31 in Mass Shootings*, August 2019
- [Fordham News, Former FBI Agent Sounds Alarm on Cyber Security, August 2019](#)
- CNN, *Senate Report: Russia Targeted All 50 States in 2016 Election*, July 2019
- CNN, *Senate Intel Report Details Russia's Wide-Ranging Election Interference in 2016*, July 2019
- [Fordham News, Panel Finds Election System Sound, but Voices Concern About Social Media and Turnout, July 2019](#)
- [Connected World, AI is Both Friend and Foe in Cybersecurity, July 2019](#)
- [CNN, "Person of Interest" in Student's Disappearance, June 2019](#)
- CNN, *At Least 12 Dead in Mass Shooting in Virginia Beach*, May 2019
- CNN, *"Close Collaborator" of Assange Under Arrest*, April 2019

HIGHLY CONFIDENTIAL // SUBJECT TO PROTECTIVE ORDER

- CNN, *Wikileaks Founder Julian Assange Facing Extradition to U.S. on Conspiracy Charge After Dramatic Arrest in London*, April 2019
- [CNN, Experts Detail Alleged Intruder's Sophisticated Tools, April 2019](#)
- [The Washington Post, How Nest, designed to keep intruders out of people's homes, effectively allowed hackers to get in, April 2019](#)
- [IT Pro Today, RSA 2019: Experts Consider AI as a Security Topic to Watch, February 2019](#)
- The Washington Post, *The Cybersecurity 202: FBI cyber investigations hit hard by shutdown*, January 2019
- CNN, *Manhunt for Serial Bomber Behind Mass Assassination Attempt*, October 2018
- [60 Minutes, When Russian hackers targeted the U.S. election infrastructure, April 2018](#)
- [Bloomberg CityLab, Are Dockless Bikes a Cybersecurity Threat?, February 2018](#)
- [CNN, Special Report: The Trump-Russia Investigation, January 2018](#)
- Expansión Newspaper (Spain), *Cybercriminals act every day of the year*, November 2017
- [Bloomberg Tech TV, Equifax Data Breach, September 2017](#)
- [National Public Radio, Russian Cyberattack Targeted Elections Vendor Tied To Voting Day Disruptions, August 2017](#)
- Time Magazine, *Inside the Secret Plan to Stop Vladimir Putin's U.S. Election Plot*, July 2017
- [Bloomberg Tech TV, Hackers Find Flaws in Voting Machines, July 2017](#)

Recent Publications

- [FTI Journal, 10 Cyber Risks and Realities We're Seeing This Year — And Beyond, February 2023](#)
- [Corporate Compliance Insights, A National Cyber Strategy is Coming. Are You Prepared?, November 2022](#)
- [The Hill, Unaccounted Consequences of a War Between Russia and Ukraine, February 2022](#)
- [Intelligent CIO, Why Cyber-risk Mitigation Should be Top Priority for Every Organization, January 2022](#)
- [Security Magazine, A Disturbing Trend – Road to a Cyber Dark Age, January 2021](#)
- [The Hill, The US Presidential Election is Under Attack, October 2020](#)
- [The Expert Briefing with FTI Cybersecurity, The COVID-19 Cyber Threat Landscape, October 2020](#)
- [The Hill, States Must Take Action to Protect Against Unemployment Fraud, June 2020](#)
- [Law360, 9 Post-Coronavirus Cybersecurity Predictions for Cos., June 2020](#)

HIGHLY CONFIDENTIAL // SUBJECT TO PROTECTIVE ORDER

- [The Hill, COVID-19: Attempts to Influence and Deceive, April 2020](#)
- [COVID-19: New Cyber Threats, March 2020](#)
- [The Hill, 2020 Cybersecurity Predictions: Evolving Vulnerabilities on the Horizon, January 2020](#)
- [The Hill, Playing With Fire: Global Offensive Cyber Operations, October 2019](#)
- [FTI Journal, How Can I Tell If My Third-Party Vendors Are Adequately Protecting Organizational Data From Hackers?, October 2019](#)
- [High Performance Counsel, Business Email Compromise: How To Avoid Becoming A Victim, April 2019](#)
- [Corporate Compliance Insights, 10 Corporate Cybersecurity Predictions What You Need to Know for 2019 - and Beyond, February 2019](#)
- [FTI Journal, C-Suite Alert: US DOJ Updates Guidelines for Managing Cyber Attacks, January 2019](#)
- [FTI Journal, How Asset Management Firms Can Combat the Growing Threat of Cyber Attack, January 2019](#)
- [ISSA, Cryptocurrency and Corporate Security, August 2018](#)
- [Cyber Security: A Peer-Reviewed Journal, The Impact of GDPR on WHOIS: Implications for Businesses Facing Cybercrime, July 2018](#)
- [Connected Risks: Cybersecurity Regulations and Mitigation Approaches in US, Europe & Asia, April 2018](#)
- [Corporate Board Member, The Insiders: Cybersecurity, April 2018](#)
- [CSO Online, 3 Top Cyber Experts Speaking Out, January 2018](#)
- [FTI Journal, Should I Fear the Reaper?, January 2018](#)
- [Yahoo! News, Cyberwar is our era's Cuban missile crisis. We need to de-escalate, now, November 2017](#)
- [Power Magazine, Why CrashOverride Is a Red Flag for U.S. Power Companies, November 2017](#)
- [New York Law Journal, Vulnerability Management: A Holistic View, October 2017](#)
- [Insurance Journal, What Insurance Companies Need to Know About Part 500 Cybersecurity Compliance, October 2017](#)
- [Risk Management Magazine, Enhancing Security with Big Data Analytics, October 2017](#)
- [Equifax Breach a Category 4 or 5 Attack, but By No Means Unique, September 2017](#)
- [Information Systems Security Association Journal, Battening Down for the Rising Tide of IoT Risks, August 2017](#)

HIGHLY CONFIDENTIAL // SUBJECT TO PROTECTIVE ORDER

Notable Speaking Engagements

- Financial Executives International's Corporate Financial Reporting Insights Conference, *Cybersecurity Incident Reporting*, New York, NY, November 2022
- International Conference on Cyber Security, *Welcome Remarks*, New York, NY, July 2022
- New York Stock Exchange Board Advisory Council, *Cybersecurity Panel*, New York, NY, June 2022
- Maine Law Privacy & Security Conference, *Cyber Solutions: Building the Team to Prepare and Respond to Incidents*, Portland, ME, June 2022
- Spring Lumen Customer Advisory Board, *Seized: Assessing the Situation and Seized: Make a Plan*, Webinar, March 2022
- Morgan Lewis, *A View from the Experts: DOL Cybersecurity Guidance: What It Means and How to Implement It*, Webinar, January 2022
- Florida General Counsel's Forum for Public Companies, Palm Beach, FL, November 2021
- Privacy + Security Forum, *Ransomware Trends, Pitfalls, and Best Practices*, Webinar, September 2021
- Wall Street Journal Pro, *Don't Forget about Nation-state Attacks*, Webinar, September 2021
- Hogan Lovells, *Cybersecurity Risks and Preparedness*, Webinar, September 2021
- Financial Markets Association Securities Compliance Seminar, *Cybersecurity and Data Privacy: Practical Considerations for Mitigating Risk, Responding to Incidents and Addressing COVID-19*, Webinar, April 2021
- Securities Enforcement Forum, *Cybersecurity and Cryptocurrency Regulation, Enforcement and Litigation*, Webinar, October 2020
- ABA Cybersecurity, Privacy and Data Protection Committee, *Cyber-Related Litigation and Best Practices for Incident Preparedness and Response*, Webinar, August 2020
- International Association of Privacy Professionals, *The New Normal: Navigating "Work From Home" Privacy and Cybersecurity Risks*, Webinar, May 2020
- AICPA Forensic & Valuation Services Conference, *A Look into the Future of Blockchain Litigation*, Las Vegas, NV, November 2019
- Institutional Investor Legal Forum Fall Roundtable, *Cybersecurity: Confronting an Existential Threat*, Washington, DC, October 2019
- Privacy + Security Forum, *Best Practices for Preparing a Ransomware-Related Cyber Incident Response Plan*, Washington, DC, October 2019
- Kirkland & Ellis, *Cybersecurity Trends Impacting Healthcare Businesses*, New York, NY, October 2019
- DEF CON 27, *Coffee Talk with Anthony Ferrante*, Las Vegas, NV, August 2019

HIGHLY CONFIDENTIAL // SUBJECT TO PROTECTIVE ORDER

- ICCS, *The Tipping Point: Cyber Risks to Election Systems*, New York, NY, July 2019
- Security & Risk Leadership Academy, *Anything You Say Can and Will Be Used Against You*, Skytop, PA, June 2019
- Securities Enforcement Forum West, *Cybersecurity Disclosure and Enforcement: Will the SEC Drop the Hammer in 2019*, East Palo Alto, CA, May 2019
- Spark Leadership Forum, *Anything You Say or Do May Be Used Against You*, Napa, CA April 2019
- Greenberg Traurig, *Cybersecurity Incident Response and Crisis Management Seminar*, New York, NY, March 2019
- RSA Conference, *AI: Hacking without Humans How Can Human Brains Be Hacked?*, San Francisco, CA, March 2019
- RSA Conference, *Investigating IoT Crime: The Value of IoT Crime Classification*, San Francisco, CA, March 2019
- The Americas Lodging Investment Summit Law Conference, *Battling Cybersecurity Challenges & Elevating Cybersecurity Posture*, Los Angeles, CA, January 2019
- World Economic Forum's Centre for Cybersecurity, *Why We Need Global Cyber Response Principles*, Geneva, Switzerland, November 2018
- U.S.-China Economic and Security Review Commission, *Hearing on China, the United States, and Next Generation Connectivity*, Washington, DC, March 2018
- ILS Forum on International Law, *Digital Currencies in a Connected World*, Miami, FL, February 2018
- Bloomberg, *In-House Counsel's Growing Role in Cybersecurity Risk Management*, Washington, DC, January 2018
- The Conference Board, *Cybersecurity: Crucial Collaborations*, New York, NY, January 2018
- IESE Global Alumni Reunion, *New Rules in Cybersecurity*, Madrid, Spain, November 2017
- Perez-Llorca, *Cybersecurity Panel*, Madrid, Spain, November 2017
- IAWatch, *Incident Response: Planning for and Reacting to Potential Events*, Washington, DC, October 2017
- Federal Bar Association, *Litigating Cybersecurity and Defending Privacy Class Actions*, Atlanta, GA, September 2017
- Compliance Governance Oversight Council, *Cybersecurity Landscape*, Minneapolis, MN, June 2017
- Hogan Lovells, *Ready, Set, Respond*, Washington, DC, September 2016
- PKF O'Connor Davies, *Financial Issues and Trends Affecting Your Club*, New York, NY, May 2013

HIGHLY CONFIDENTIAL // SUBJECT TO PROTECTIVE ORDER

- Coalition Against Domain Name Abuse, *The Evolution of Cybercrime*, Washington, DC, October 2010
- National Committee on American Foreign Policy, *Cyber War: Perception, Reality, and Strategy*, New York, NY, October 2010